ISIS - Feature #2403

look vector from the spacecraft computation

2016-02-23 06:54 AM - Antoine Lucas

Status:	Closed		
Priority:	High		
Assignee:	Curtis Rose		
Category:	Applications		
Target version:	3.4.13 (FY16 R3 2016-08-31 Aug)		
Impact:	Campt will now have three new values added to the bottom of the output. They are look directions in: J2000, camera, and body fixed coordinate systems. Since they are added to the end of the file it does not negatively affect the flat files.	**Software Version:**	3.4.10 (FY15 R3 2015-07-23 Jul)

Description

Dear ISIS Crew

I need to compute the look vector from the sensor towards the ground (or any potential target).

I first try to write my own SPICE application based on the NAIF toolkit and using the "getfov_c" function but I realized that I might miss a lot of things such as optical distorsions. I also did not find how to retrieve the look vector for the center of an image for instance. So I decided to move my workflow to ISIS which is able to deal with up-to-date sensor model. But I did not find how to compute this look vector (that I'd like to be expresse in the center of mass of the target body). I spent a lot of time looking at the source code of campt and caminfo but I got confused in the definition of the "Subspacecraft Point" because on the glossary page:
https://isis.astrogeology.usgs.gov/documents/Glossary/Glossary.html#SubSpacecraftGroundAzimuth
it is defined either as "SubSpacecraft point (where the look vector from the spacecraft intercepts the target body)" or "The point on the surface of the target body which lies directly beneath the spacecraft." which is not the same.

So how can I compute (either from ISSI app and/or SPICE toolkit and/or from my own ISIS code) the look vector for any given pixel of any image from any supported sensor, expresse in the body fixed (center of mass) frame?
I asked the same question to the "SPICE Boys" but they seem to say that ISIS is probably more suitable for that specific task.

Thanks a lot for your help

Related issues:

Related to ISIS - Documentation #2376: The definitions for each azimuth angle...	**Acknowledged**
Related to ISIS - Documentation #4191: Add Look Direction terms to the Glossary	**Resolved**

History

#1 - 2016-02-23 10:41 AM - Tammy Becker

- Tracker changed from Bug to Question

- Status changed from New to Acknowledged

#3 - 2016-07-12 07:57 AM - Stuart Sides

- Tracker changed from Question to Feature

#4 - 2016-07-12 07:57 AM - Stuart Sides

- Target version set to 3.4.13 (FY16 R3 2016-08-31 Aug)

#5 - 2016-07-12 08:48 AM - Stuart Sides

- Assignee set to Curtis Rose

#7 - 2016-07-12 03:05 PM - Curtis Rose

- Related to Documentation #2376: The definitions for each azimuth angle in the ISIS Glossary are insufficient and confusing added

#8 - 2016-07-19 12:12 PM - Stuart Sides

- Status changed from Acknowledged to Assigned

#9 - 2016-07-19 12:44 PM - Curtis Rose

- Status changed from Assigned to In Progress

#10 - 2016-07-27 12:16 PM - Curtis Rose

- Impact updated

#11 - 2016-07-27 12:19 PM - Curtis Rose

- Impact updated

#12 - 2016-08-01 11:59 AM - Curtis Rose

- Status changed from In Progress to Resolved

#13 - 2016-08-01 07:17 PM - Tammy Becker

- Status changed from Resolved to Closed

The output looks reasonable and thank you for adding the new information on the end of the csv (flat) format for those of us who depend on the column locations.

I will be adding a separate ticket to add to the Glossary the new terms:
LookDirectionBodyFixed
LookDirectionJ2000
LookDirectionCamera

Thank you.

#14 - 2016-08-01 07:20 PM - Tammy Becker

- Related to Documentation #4191: Add Look Direction terms to the Glossary added